PROCEDURE FOR DESIGN OF DRAINAGE DITCHES AT CULVERTS

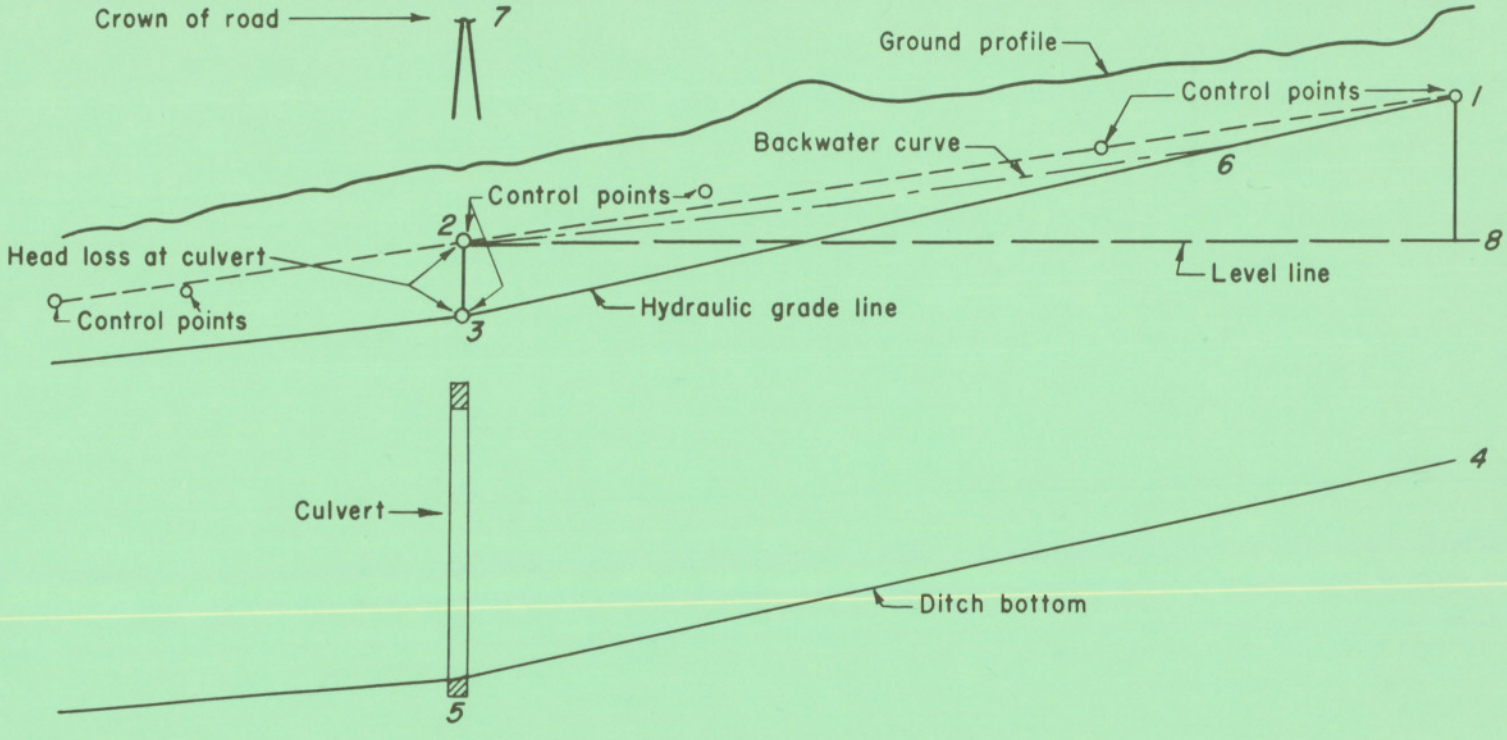

Figure 14-9.3 Procedure for design of drainage ditches at culverts

a — Set "control points" 1, 2, etc. as though no culvert is to be installed. Make distance 2 to 8 large enough so that 1 to 8 is two or more times greater than 2 to 3. Point 1 is approximately at limit of backwater curve which may be established by standard methods of computing backwater curves.

b — Normal hydraulic gradient would be line 1 to 2.

c — Compute head loss at culvert 2 to 3; measure down from upper "control point" 2 at culvert and set lower "control point" 3.

d — Draw hydraulic gradient for ditch section above culvert from "control point" at 1 to lower "control point" at 3.

e — Compute ditch section required based on drainage flow and hydraulic grade line 1 to 3 and set ditch bottom 4 to 5.

f — Culvert will cause heading-up along typical backwater curve 2 to 6; generally close to line 1 to 2, provided 1 is far enough upstream.

g — Check flood flows over crown of road depending on elevation at point 7.

REFERENCE
CHAP. 6 NEH SECTION 16

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